

### ABSTRACT OF THE DISCLOSURE

A device for separating high mass to charge particles ( $M_1$ ) from low mass to charge particles ( $M_2$ ) in a plasma includes a cylindrical wall that surrounds a chamber and defines an axis. Rectangular shaped coils are mounted on the wall to establish a magnetic field,  $B_0$ , in the chamber that is aligned substantially perpendicular to the axis and which rotates about the axis. Circularly shaped coils are provided to generate a time-constant, axially aligned magnetic field,  $B_z$ , in the chamber. Passive, ring-shaped electrodes are positioned at the ends of the wall and connected to resistors which are then grounded. The rotating magnetic field,  $B_0$ , rotates the plasma in the axially aligned magnetic field,  $B_z$ , which in turn, induces a radially oriented electric field,  $E_r$ , in the chamber. The crossed fields (i.e.  $E_r \times B_z$ ) cause the particles,  $M_1$ , to strike the wall while the particles,  $M_2$ , transit through the chamber.

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